

Claims:

1. A portable radio device comprising:
  - a first casing;
  - 5 a second casing;
  - a connection portion, connecting the first casing to the second casing so as to freely rotate;
  - a first antenna element, provided in the first casing;
  - a conductor element, provided in the second casing to form a dipole
- 10 antenna together with the first antenna element; and
  - a feeding portion, having one end electrically connected to the first antenna element and the other end electrically connected to the conductor element.
- 15 2. The portable radio device as set forth in claim 1, wherein a plurality of first antenna elements are provided in the first casing; and the portable radio device further comprising a switching portion which switches the plurality of first antenna elements so as to connect to the feeding portion.
- 20 3. The portable radio device as set forth in claim 2, wherein the switching portion switches whether the plurality of the first antenna elements are electrically connected to the feeding portion or the plurality of the first antenna elements are electrically connected to the conductor element, respectively.

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4. The portable radio device as set forth in claim 2, further comprising a half-wavelength element being electrically connected between at least one of the plurality of the first antenna elements and the switching portion.
- 5 5. The portable radio device as set forth in claim 2, further comprising a plurality of half-wavelength elements being respectively electrically connected to the plurality of the first antenna elements,  
wherein the switching portion selectively switches the plurality of the first antenna elements and the plurality of the half-wavelength elements so as  
10 to connect to the feeding portion.
6. The portable radio device as set forth in claim 1, further comprising a plurality of impedance matching portions respectively corresponding to the plurality of the first antenna elements.
- 15 7. The portable radio device as set forth in claim 2, further comprising:  
a casing opening and closing state detecting portion, detecting whether or not the first casing and the second casing are opened to each other; and  
20 a control portion, controlling the switching portion in accordance with the detected result of the casing opening and closing state detecting portion.
8. The portable radio device as set forth in claim 2, further comprising a control portion, determining a receiving level of a radio circuit portion to control the switching portion so as to raise the receiving level.  
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9. The portable radio device as set forth in claim 1, wherein the antenna element and the conductor element are respectively formed in plate shapes along the surfaces of the first casing and the second casing.

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10. The portable radio device as set forth in claim 9, further comprising:  
a circuit board, provided in the second casing and having a radio circuit,

10 wherein the conductor element is formed in a ground pattern which is formed on the circuit board provided in the second casing;

wherein a ground of the radio circuit portion is electrically connected to the ground pattern; and

wherein the feeding portion is provided in the radio circuit portion.

15 11. A portable radio device as set forth in claim 1, further comprising:  
a second antenna element, provided in the second casing near the connection portion;

an opening and closing state detecting portion, detecting the opening and closing states of the first casing and the second casing; and

20 a switching portion, selecting and switching any one of the first antenna element and the second antenna element to a connection to a signal processing portion for performing a signal process in accordance with the detected result of the casing opening and closing state detecting portion,

25 wherein when the first casing and the second casing are opened, the first antenna element and the conductor element form the dipole antenna; and

wherein when the first casing and the second casing are closed, the second antenna element and the conductor element form a mono-pole antenna.

5       12.     The portable radio device as set forth in claim 11, wherein when the first casing and the second casing are opened, the switching portion selects the first antenna element; and

            wherein when the upper casing and the lower casing are closed, the switching portion selects the second antenna element.

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13.     The portable radio device as set forth in claim 1, further comprising:  
            a second antenna element provided in the second casing near the connection portion;

15       a receiving field intensity measuring portion, measuring the receiving field intensity of a signal received by the first antenna element or the second antenna element; and

20       a switching portion, selecting and switching the antenna element having a higher receiving field intensity to a connection to a signal processing portion for performing a signal process in accordance with the measured result of the receiving field intensity measuring portion,

            wherein the first antenna element has a first feeding point for electrically connecting to the conductor element;

            wherein the second antenna element has a second feeding point for electrically connecting to the conductor element; and

25       wherein the first feeding point and the second feeding point are

provided at the diagonal positions of opposed sides when the first casing and the second casing are opened.

14. The portable radio device as set forth in claim 11, further comprising:

5 a first matching portion, matching the impedance of the first antenna element to a prescribed value; and

a second matching portion, matching the impedance of the second antenna element to a prescribed value.

10 15. The portable radio device as set forth in claim 1, further comprising:

a circuit board, provided in the second casing;

a plurality of feeding portions, feeding electric current to the antenna element and being separated to each other;

a radio circuit, disposed in the circuit board; and

15 a switching portion, provided between the plurality of feeding portions and the radio circuit and selecting any one of the plurality of the feeding portions to connect the radio circuit.

16. The portable radio device as set forth in claim 1, further comprising:

20 a circuit board, provided in the second casing;

a radio circuit, disposed in the circuit board and electrically connected to the feeding portion;

a ground portion, spaced from the feeding portion and connecting the antenna element to the circuit board; and

25 a switching portion, switching whether the ground portion is

connected to the circuit board or the ground portion and the circuit board are opened.

17. The portable radio device as set forth in claim 16, wherein a plurality  
5 of ground portions are provided; and

wherein the ground portions are disposed so as to be spaced apart in  
the end part of the antenna element connected to the second casing.

18. The portable radio device as set forth in claim 17, wherein the  
10 switching portion switches the ground portions respectively.

19. The portable radio device as set forth in claim 16, wherein the  
connection portion has an electric conductivity; and

15 wherein the ground portion is electrically connected to the antenna  
element through the connection portion.

20. The portable radio device as set forth in claim 1, wherein the  
connection portion has an electric conductivity; and

20 wherein the feeding portion is electrically connected to the antenna  
element through the connection portion.

21. The portable radio device as set forth in claim 15, further comprising:  
a control circuit, controlling the switching portion in accordance with  
the level of a receiving signal received by the radio circuit.

22. The portable radio device as set forth in claim 1, wherein the first antenna element is an electric conductive frame forming a part of the first casing.